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Age-Related Differences in Levels and Dynamics of Workplace Affect

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## Abstract

Affective experiences at work are a key contributing factor to long-term job-related well-being and effectiveness, yet may systematically change as workers get older. Given the central role of affect in work settings, it is important to obtain a thorough understanding of older workers' strengths and vulnerabilities in affective functioning. This paper's goal was to comprehensively study age differences in mean levels and dynamics of affect (affect stability, occurrence of positive and negative daily work events, and affective reactivity) and to link these with perceptions of global occupational well-being and effectiveness. In three diary studies, employees of different occupational and cultural backgrounds (Hong Kong Chinese managerial employees, German hospital employees, German office workers) reported daily affective work events and affect across multiple workdays. Higher age was associated with more positive and less negative affect (Study 1), more frequent positive daily work events (Study 2 and 3) and lower variability of negative affect (Study 1 and 2). Age was unrelated to frequency of negative work events and positive event reactivity (all studies). There were mixed age differences in negative event reactivity (lower reactivity in Study 1 and on subtypes of affect in Study 2, but higher worry in Study 3). Several of the indicators of affective experience emerged as mediators of positive age differences in work engagement and self-rated task performance. Overall, with one exception, results point at maintenance or improvement of workers' affective functioning with age. Through improved affective functioning, older workers likely contribute to organizational effectiveness.

*Keywords:* aging workforce, affect dynamics, affective work events, job attitudes, task performance

Affective experiences are an inevitable part of daily work life. Moods and emotions experienced at work influence employees' cognitions, attitudes, and behaviors (Brief & Weiss, 2002). Workplace affect has for instance been found to predict health and absenteeism (Bono, Glomb, Shen, Kim, & Koch, 2013), job satisfaction (Dimotakis, Scott, & Koopman, 2011; Pelled & Xin, 1999), affective commitment to the organization (C. D. Fisher, 2002), job performance (Kaplan, Bradley, Luchman, & Haynes, 2009; Spector & Fox, 2002), and team cohesion and effectiveness (Barsade & Knight, 2015). In light of the aging workforce, an important question is how different aspects of workplace affect, including mean levels and variability of daily affective experiences at work, change as workers get older. Although there is a substantial knowledge base on affective development across adulthood from general-population samples, it remains open whether findings generalize to worker samples (Scheibe & Zacher, 2013). Not only are there substantial differences in age range – worker samples typically do not include adults over the age of 65, – the affective events people encounter, their motivational orientation, and their affect-regulatory options also may vary substantially between work and nonwork contexts (Scheibe, Wisse, & Schulz, 2015). Moreover, few studies to date have linked age differences in workplace affect to job-related attitudes and behaviors.

With the present project, we aim to provide a comprehensive account of age differences in the affective lives of workers. Specifically, we adopt an intraindividual perspective to illuminate how aging shapes dynamics of workplace affect at the daily level. With affect dynamics we refer to variations and co-variations of affective events and experiences over time, which can be examined whenever such events and experiences are measured repeatedly in the same individuals in their natural environments. Pulling together data from three diary studies of workers from different occupational sectors (healthcare, administration, and managerial) and cultural backgrounds (Hong Kong and Germany), we examine age differences in mean levels and dynamics of workplace affect

and their links with job attitudes and self-rated task performance. Across the three studies, participants reported on daily work events and affective states for up to 15 workdays. Besides aggregates of mean levels of affect across sampling occasions, we derived three indicators of affect dynamics: (1) affective variability (i.e., fluctuations around mean levels of affect over time), (2) the frequency of positive and negative daily work events, and (3) affective reactivity to daily events (during or surrounding the event). Figure 1 provides an overview of our conceptual model, specifying the different indicators of workplace affect that we considered.

Our aim was twofold: first, to examine age differences in mean levels and dynamic aspects of workplace affect. A fine-grained look at age differences in affective experience, as adopted here, is common in the lifespan literature but is a novel contribution to research on work and aging which so far is largely limited to global, one-time assessments of affect. Second, we aimed to test whether age has indirect effects via affective experiences on global perceptions of job satisfaction, work engagement, and effectiveness in the job. The consideration of positive work outcomes represents an important extension of theories and research on emotional development across adulthood. Knowledge of these issues will further our understanding of the practical implications of adult emotional development and the impact of the aging workforce on individual and organizational effectiveness.

### **Age Differences in Levels and Stability of Workplace Affect**

Theories of well-being across adulthood suggest that aging is marked by improvements in affective well-being at least into young-old age. Socioemotional selectivity theory (SST, Carstensen, 2006) holds that an increasing perception of time limitation leads older adults to place higher priority on experiencing emotional meaning and well-being in the present, relative to acquiring knowledge and building resources. Through cognitive and behavioral mechanisms, such as the well-documented positivity effect in attention and memory (Reed, Chan, & Mikels, 2014) or a stronger

1 tendency to avoid interpersonal conflicts in older adults (Birditt, Fingerman, & Almeida, 2005),  
2 these motivational shifts can benefit well-being. In an extension of SST, strength and vulnerability  
3 integration theory (SAVI; Charles, 2010) holds that changes in emotional well-being can be linked  
4 not only to differences in remaining time in life, but also enhanced expertise in regulating emotions  
5 accumulated over time. A recent systematic review indeed yielded age-related advantages in several  
6 aspects of emotion regulation (Doerwald, Scheibe, Zacher, & Van Yperen, 2016). Although existing  
7 theories also specify boundary conditions for positive age-related trends in affective functioning  
8 (Charles, 2010), overall the theories converge in predicting higher average levels of affective well-  
9 being in older age.

10 Consistent with this assumption, cross-sectional studies that chart levels of affect in general-  
11 population samples find that age is associated with higher levels of affective well-being, which is  
12 mostly driven by reductions in mean levels of negative affect and less often by increases in positive  
13 affect (Charles, 2010; Morgan & Scheibe, 2014). Longitudinal studies that follow participants for 10  
14 up to 23 years show that positive age trends in affect do not typically continue in late adulthood;  
15 rather, affective well-being tends to improve until the mid to late 60s and decrease thereafter  
16 (Sliwinski & Scott, 2014). However, this turn in affect trajectories in the mid to late 60s should not  
17 affect the working population as most people retire before the downward trend in affective well-  
18 being would set in. Indeed, several cross-sectional studies focusing on *worker samples* yielded  
19 higher levels of positive affect and/or lower levels of negative affect with age (Dahling & Perez,  
20 2010; Lin, Wu, Chen, & Chen, 2014; Wegge, van Dick, Fisher, West, & Dawson, 2006; Yeung,  
21 Wong, & Lok, 2011), although other studies find age to be unrelated to affect (Bindl, Parker,  
22 Totterdell, & Hagger-Johnson, 2012; Lee & Allen, 2002; Tavares, 2016; Yeung & Fung, 2012).  
23 Positive age trends in affective well-being at work are consistent with meta-analytic findings on the  
24 relationship between age and work motives, indicating that older workers emphasize intrinsic

1 motives (such as accomplishment, job enjoyment, and skill utilization) more than younger workers  
2 do (Kooij, de Lange, Jansen, Kanfer, & Dijkers, 2011). Thus, although the evidence on worker age  
3 and affect is somewhat mixed, it is notable that negative age trends of affect are rarely observed. For  
4 the present studies, we therefore predicted that worker age is associated with higher mean levels of  
5 positive affect and lower mean levels of negative affect (*Hypothesis 1*).

6       Affect stability represents the degree to which affect fluctuates around mean levels of affect  
7 over time. It is regarded as an individual difference characteristic in the sense that some people vary  
8 more in their affective experiences than others (Eid & Diener, 1999). Fluctuations may occur in  
9 response to various internal or external influences, such as work stressors, and reflect how people  
10 deal with changes in their environment and regulate their emotions (Beal & Ghandour, 2011;  
11 Kuppens, Oravecz, & Tuerlinckx, 2010). A common operationalization is the intraindividual  
12 standard deviation of affect across multiple measurement occasions. There is solid evidence that  
13 affect variability is negatively linked to indicators of psychological health and well-being, with this  
14 relationship being stronger for negative than positive affect variability (Houben, Van Den Noortgate,  
15 & Kuppens, 2015). In other words, more stable affective experiences appear to be a correlate of  
16 mental health.

17       Past studies with general-populations samples consistently show that affect stability is higher  
18 in older adults compared to young adults (Brose, Scheibe, & Schmiedek, 2013; Röcke, Li, & Smith,  
19 2009). This can partly be attributed to changes in life contexts. In particular, younger and older  
20 adults, who are matched on stressor occurrence, severity, and impact, were found to be more similar  
21 in affective variability across 100 days than the unmatched groups of younger and older adults  
22 (Brose et al., 2013). However, even when accounting for life context characteristics, age differences  
23 in negative affect variability were not fully eliminated (Brose et al., 2013). Another study also  
24 reported reduced variability for negative affect, though age differences in positive affect variability

were not confirmed (Grühn, Lumley, Diehl, & Labouvie-Vief, 2013). To the best of our knowledge, no study has yet assessed age differences in affect variability in the work setting, rendering this an important area of inquiry. Based on developmental theories and prior findings of older adults' higher affect stability in general-population samples, we predicted that worker age is associated with higher affect stability across measurement occasions (*Hypothesis 2*).

### **Age Differences in Occurrence of and Reactivity to Daily Work Events**

Theoretically, more positive and stable workplace affect with age could result from a lower exposure to negative daily work events and/or more exposure to positive events, or from effectively regulating emotions vis-à-vis everyday work events (Scheibe & Zacher, 2013). Studying the occurrence of and affective reactivity to daily events experienced at work thus promises unique insight into the impact of aging on the affective lives of workers and the resulting work outcomes. The present studies make use of the diary design to assess daily experiences at work, which provide information about the appraisal of daily discrete events as positive or negative and the co-variation with affect.

There is evidence from several general-population studies that older adults report fewer distressing events in their everyday life than younger adults do (see Riediger & Rauers, 2014, for review). A large-scale investigation of U.S. adults ranging in age from 24 to 74 years reporting on daily experiences across eight consecutive nights revealed that young and middle-aged adults reported more frequent everyday stressors than older adults (Almeida & Horn, 2004). Using the same dataset, Neupert et al. (2007) found middle-aged adults to encounter fewer interpersonal arguments than young adults, but comparable numbers of negative work events (hassles at work other than interpersonal conflicts). Other experience-sampling and qualitative studies similarly reported negative age trends in the number of unpleasant events (Sliwinski, Smyth, Hofer, & Stawski, 2006; Stawski, Sliwinski, Almeida, & Smyth, 2008).



Despite the fact that the self-reported occurrence of positive daily events is about twice as high as for negative events (Aldwin, Jeong, Igarashi, & Spiro Iii, 2014; Charles et al., 2010; Gunaydin, Selcuk, & Ong, 2016), very few studies have focused on age differences in positive daily events. In one study of older women (in their 60s to 90s), positive daily events were reported less frequently with age (Charles et al., 2010). A longitudinal study with older men (in their 50s to 90s) across 16 years showed increases in occurrence of uplifts until the early 60s and decreases thereafter (Aldwin et al., 2014). Unfortunately, given their age range these studies provide limited information on what would be expected for a working sample. Nevertheless, as positive events arise from attention and appraisal processes, just like negative events (Lazarus & Folkman, 1984), and given predictions of an enhanced motivation to focus on the positive aspects and selection into positive environments with age (Carstensen, 2006), one may expect age-related increases in occurrence of positive daily work events. For the present study, we therefore predicted that older workers report (a) lower occurrence of negative daily work events and (b) higher occurrence of positive daily work events (*Hypothesis 3*).

Along with the assessment of positive and negative daily events at work, the present studies also examine whether older workers show similar or different affective reactivity to these events. Affective reactivity is usually operationalized as the degree to which affect experienced during, or close to, discrete events deviates from baseline levels. According to the SAVI model, time is an important dimension to consider when studying age differences in affective reactivity to daily events (Charles, 2010). Age advantages are mostly expected before and after negative events but not necessarily in the midst of negative events. Before and after events, affective arousal is relatively low and older adults should be able to effectively use cognitive-behavioral emotion regulation strategies such as positive reappraisal or situation selection to maintain well-being. In the midst of negative events when affective arousal is high, in contrast, such strategies are often difficult to use

1 and older adults' lower physiological flexibility likely prolongs recovery (Charles, 2010). In studies  
2 of daily stress, it is therefore important to consider how affective reactivity is measured: As the  
3 immediate response to an event (e.g. retrospectively rated as affect intensity or stressfulness), or as  
4 affective experiences surrounding the event (e.g. affect frequency during the day that the event  
5 occurred).

6       Keeping this distinction in mind, the available evidence on age differences in reactivity to  
7 daily stressors is mixed (see also Sliwinski & Scott, 2014). A limited number of studies that  
8 examined immediate reactivity (operationalized as perceived stressfulness) found reduced affective  
9 reactivity to daily stressors in older as compared to younger adults (Birditt et al., 2005; Charles &  
10 Almeida, 2007). Studies that examined affective experience surrounding daily negative events found  
11 either reduced reactivity with age (Brose et al., 2013; Piazza, Charles, & Almeida, 2007), no age  
12 differences (Röcke et al., 2009; Stawski et al., 2008), or higher affective reactivity with age for  
13 complex daily stressors (Wrzus, Müller, Wagner, Lindenberg, & Riediger, 2013). Neupert et al.  
14 (2007) distinguished different types of stressors and observed reduced affective reactivity (measured  
15 as frequency of distress on stressor days relative to non-stressor days) with age to interpersonal  
16 stressors, but no age differences in affective reactivity to work stressors. One of the few available  
17 longitudinal studies found an age-related increase in affective reactivity (also measured as frequency  
18 of distress on stressor relative to non-stressor days) over a time interval of 10 years (Sliwinski,  
19 Almeida, Smyth, & Stawski, 2009).

20       Again, there is a dearth of theory and research on age differences in affective reactivity to  
21 *positive* daily events. We are aware of only one study on this issue: relative to younger adults, older  
22 adults reported larger reductions in negative affect on positive event days compared to non-event  
23 days, though the event-related increase in positive affect was comparable across ages (Gunaydin et  
24 al., 2016). Importantly, while older adults tend to be more motivated than younger adults to maintain

positive affect, they do not report a heightened motivation to *increase* positive affect in their daily life (Riediger, Schmiedek, Wagner, & Lindenberger, 2009). Given the mixed prior evidence, we did not specify directed hypotheses on worker age and affective reactivity, but posed the following research questions: What is the relationship between worker age and affective reactivity to daily positive and negative work events, and does it matter whether affect is assessed during the event (as affect intensity) or on the day surrounding the event (as affect frequency)?

### **Age, Affect Dynamics, and Work Outcomes**

Affective daily events and their emotional sequelae also affect work outcomes. Based on perspectives from affective events theory (Weiss & Cropanzano, 1996) and the episodic process model of performance (Beal, Weiss, Barros, & MacDermid, 2005), one can speculate that improvements in the affective lives of workers help explain previously identified age advantages in job attitudes (Ng & Feldman, 2010). Both of these theories position moods and emotions experienced at work as key factors driving work-related outcomes. Affect fluctuations are thought to lead to fluctuations in task performance, with negative emotions pulling cognitive resources off-task and positive emotions enhancing task attention (Beal et al., 2005). Although these processes operate on a momentary level, effects accumulate over time, such that employees with higher mean levels of affective well-being display more positive job attitudes (Spector, 1997) and show higher job performance (Kaplan et al., 2009).

In addition, there is accumulating evidence on intra-person associations between workplace affect, job attitudes, and task performance. Bledow and colleagues (2011), for instance, found that negative affect and negative events experienced in the morning of a working day predicted higher work engagement in the afternoon if workers managed to turn negative affect into positive affect during the day. Dimotakis et al. (2011) report that positive and negative affect resulting from daily interpersonal interactions at work predicted daily job satisfaction. Rothbard and Wilk (2011) found

that in a sample of call center employees, within-person positive and negative affect subsequent to calls was significantly associated with daily objective task performance. Collectively, these studies suggest that affect dynamics at work predict work outcomes. Age differences in affect dynamics therefore likely trickle down to impact job-related attitudes and behaviors. We predicted that worker age is indirectly associated with positive job attitudes and higher sense of effectiveness and work engagement via (a) mean levels of affect, (b) affect stability, (c) occurrence of daily work events, and (d) affective reactivity to daily work events (*Hypothesis 4*).

### **The Present Studies**

The present investigation comprises three diary studies with samples from diverse occupational and cultural backgrounds and different methods of assessing daily affect and events. The samples include Hong Kong Chinese managerial employees (Study 1), German employees of one large hospital operator (Study 2), and German administrative and office workers with heterogeneous occupational backgrounds (Study 3). The number of daily surveys was 15, 10, and 3, respectively, for Studies 1 to 3. Whereas in Studies 1 and 2, we obtained one affect and event measurement per workday, in Study 3, participants reported their affect in response to up to 6 positive and 6 negative work events per workday. Regarding affective reactivity, Studies 1 and 3 assessed affect intensity during specific events, whereas Study 2 assessed affect frequency on the day of the event. Job attitudes and self-rated task performance were assessed in a baseline survey. Due to design differences, Hypotheses 1 and 2 could be tested in the first two studies only, while the remaining hypotheses and our research questions on affective reactivity could be tested in all three studies.

The diverse samples and methods help determine robustness of findings. Past studies showed that German and Chinese workers vary in the rank order of various work values (e.g., Chinese workers ranked achievement and advancement as more important, and meaningful work and

positive social relationships as less important than German workers; Elizur, Borg, Hunt, & Beck, 1991) and in the importance of work in life (i.e., German employees perceive work as more important than Hong Kong Chinese employees; World Values Survey Association, 2010-2014). This suggests that affective responses to daily work events, as well as affect-work outcome relationships, could be less pronounced in Hong Kong Chinese than German participants. The nature of affective work events can further vary depending on occupational characteristics. Managerial and healthcare workers on average face higher emotional demands (such as establishing and maintaining relationships or influencing others) than office workers, while office work entails higher demands of interacting with computers and analyzing data or information (O\*NET Occupational Network; United States Department of Labor/Employment and Training Administration, 2018). Hence, the frequency and nature of affective work events, and their affective ramifications, may differ between samples. Our data therefore represent an important step towards establishing generalizability across cultures and occupations.

### Study 1 (Hong Kong Chinese Managers)

#### Method

**Participants and procedure.** One hundred and fifty Chinese managerial employees aged between 25 and 62 years ( $M = 42.45$ ,  $SD = 8.97$ ) took part in this diary study that spanned a three-week period. Among them, 54% were female and 60.7% were in a supervisory position. Average organizational tenure was 11.31 years ( $SD = 9.94$ ).

Participants met the research assistant individually to learn about the study details and procedures. They were first asked to sign the paper consent form and confidentiality of responses was assured. Participants then completed a baseline online survey which assessed demographic information, job satisfaction, and self-reported task performance. Each participant was then assigned a unique login ID and password and was instructed to complete a 10-min online survey each evening

for 15 consecutive workdays. There were 37 participants who completed 16 surveys, while the rest completed 15 surveys (compliance rate 100%). Most of the participants (93.4%) submitted the daily reports on the same evening. For the participants who did not submit the report on a particular day, a reminder was sent, and they were allowed to complete it before 11 a.m. on the next day. In each diary, the participants were asked to report the events happened on the day and their affective responses to these events. We also recorded the day of the week (0 = Monday, 1 = Tuesday, 3 = Wednesday, etc.) and time of the day (1 = morning; 2 = evening) and added them as covariates in the analyses. Each participant received HKD500 (~USD63) after completing the study. The study was approved by the Research Ethics Committee at City University of Hong Kong.

### Measures.

**Daily work events.** In each diary, the participants were asked to report the events happened at work. A list of nine positive and nine negative work events was developed based on past studies on work-related events (Mignonac & Herrbach, 2004) and interpersonal tensions in the workplace (Yeung, Fung, & Chan, 2015). Positive work events include “successfully completed a project or a task,” and “received praise from your supervisor.” Negative work events include “job performance has been criticized,” and “had disagreement with other colleague about the task or organizational policy.” The option “no event” was also given if none of the positive or negative events happened on the day. The reports with no event ( $n = 954$ ) were excluded from the following analyses as affective responses were not assessed on these sampling days.

After the participants had reported which event(s) happened during work, they were asked to give a rating from 1 = *very bad* to 6 = *very good* to indicate the valence of each event. If the participant had reported more than one event on a given day, only the event with the highest intensity was selected to provide further questions on emotional reactions to this event. For example, if two events were experienced by a participant during the day, one was rated as 2 (*bad*) and the

other as 1 (*very bad*), the latter event was selected by the system and treated as the most salient event that happened on that day. This score was used to indicate the *valence* of the work event, with the score of 3 or below being categorized as a negative event while the score of 4 or above being grouped as a positive event. The total numbers of positive and negative event days were 654 and 679 respectively. Accordingly, the total number of event reports is 1333, with an average of 4.51 positive and 4.82 negative event days per participant.

***Positive and negative affective responses to work events.*** After the participants gave ratings to the most salient event happened on the day, they were asked to report their affective responses to this event. With reference to prior studies on emotions at work (Fisher, 2000; Yeung & Fung, 2012), this study measured six positive emotions (*happy, joyful, enthusiastic, excited, calm, and relaxed*), and five negative emotions (*angry, sad, anxious, worried, and irritable*) experienced during the event. Participants rated these affective terms on a five-point Likert scale (1 = *not at all* to 5 = *extremely*). A confirmatory factor analysis (CFA) was conducted using MPlus 7 (Muthén & Muthén, 1998-2015). The results of CFA revealed that the goodness-of-fit of the two-factor model containing positive and negative affect ( $\chi^2 = 575$ ,  $df = 85$ ; CFI = .94; RMSEA = .07, Omega = .50) was better than that of a single-factor model ( $\chi^2 = 1870$ ,  $df = 90$ ; CFI = .79; RMSEA = .12, Omega = .59) and a four-factor model distinguishing affect by valence and arousal ( $\chi^2 = 2814$ ,  $df = 83$ ; CFI = .67; RMSEA = .16, Omega = .50). Therefore, positive and negative affect scores were computed for each diary report.

***Person-level variables.*** In the baseline survey, we recorded demographic information, including age (in years), gender (0 = men, 1 = women), organizational tenure (in years), and job position (0 = officer, 1 = manager). We also assessed two global work outcomes. Kunin's (1955) single-item faces scale was used to measure the participants' overall job satisfaction. The participants were instructed to choose one of the seven faces that best represents their feeling

about their job in general, with higher scores indicating higher job satisfaction. Self-reported task performance was assessed using a four-item measure (Yeung & Fung, 2009), in which participants rated their efficiency, quality, effectiveness, and overall performance on a 5-point scale (1 = *unsatisfactory* to 5 = *excellent*). The measure had adequate reliability ( $\alpha = .86$ ).

## Results

**Preliminary analyses.** Table 1 presents the descriptive and correlation statistics of the person-level and day-level variables. Age was positively correlated with organizational tenure ( $r = .57$ ), and gender was negatively associated with age ( $r = -.28$ ), organizational tenure ( $r = -.19$ ), and rank of position ( $r = -.25$ ),  $ps < .05$ . Positive and negative affect were moderately intercorrelated; both at the person-level ( $r = -.46$ ) and day-level ( $r = -.66$ ),  $ps < .05$ . Age was unrelated to job satisfaction and performance.

**Age differences in daily affect and work events.** We tested Hypotheses 1 (age differences in mean levels of affect) and 3 (age differences in event occurrence), as well as our research question (age differences in affective reactivity) simultaneously in one multilevel structural equation modelling (MSEM) using MPlus 7. Level 1 comprises day-level variables including positive and negative affect and valence of the work event (0 = positive event, 1 = negative event) experienced by each participant, and weekday and time of day as covariates. Level 2 includes the participants' age. A cross-level interaction was computed between age and valence of the work event to test age differences in affective reactivity. The number of diary entry, gender, organizational tenure, position, and total number of event days were included in the model as covariates. In the multilevel analyses, the maximum likelihood method was used as the estimating technique. Below we report unstandardized coefficients (labeled *B*) for all analyses.



As shown in Table 2, the multilevel analysis revealed that age was unrelated to the occurrence of daily negative events, failing to support Hypothesis 3. Weekday was negatively related to the occurrence of daily negative events,  $B = -.022$ ,  $SE = .009$ ,  $p = .021$ , suggesting that the participants experienced fewer negative events towards the end of the week. However, the participants in the managerial position were more likely to experience negative events relative to those in the lower position ( $B = .074$ ,  $SE = .037$ ,  $p = .042$ ).

Results further show that compared with younger workers, older workers reported more positive affect ( $B = .020$ ,  $SE = .006$ ,  $p = .001$ ) though no significant effect appeared for negative affect ( $B = -.005$ ,  $SE = .003$ ,  $p = .075$ ). This partially supports Hypothesis 1. Affect was also predicted by event occurrence. On days with a negative work event (relative to days with a positive event), participants reported higher negative affect and lower positive affect ( $B = .931$ ,  $SE = .044$ ; and  $B = -1.304$ ,  $SE = .046$ , respectively,  $ps < .001$ ). The relationship between valence of the event and negative affect was moderated by age ( $B = -.015$ ,  $SE = .005$ ,  $p = .001$ ), revealing that older participants experienced a lower increase in negative affect than younger participants on days with negative events. The relationship between valence of work events and positive affect was not moderated by age. Thus, in response to our research question we found older adults to react less strongly to negative work events in terms of negative affect, but equally strongly as younger adults in terms of positive affect.

**Age differences in affect stability.** To test Hypothesis 2 regarding age differences in stability of affect, we calculated for each person the intraindividual standard deviation (iSD) of positive and negative affect across days. We regressed the iSD of positive and negative affect on age in separate analyses, accounting for gender, tenure, and total number of diary days. Age negatively predicted iSD of negative affect ( $B = -.008$ ,  $SE = .003$ ,  $p = .025$ ), but not iSD of positive affect ( $B = .000$ ,  $SE = .003$ ,  $p = .890$ ). Thus, Hypothesis 2 was partially supported. When

1 additionally controlling for mean levels of negative affect, the age effect was no longer  
2 significant, probably due to the high correlation between mean and stability of negative affect  
3 (Table 1).

4 **Indirect associations of age with work-related outcomes.** To examine Hypothesis 4  
5 about the indirect effect of age on work-related outcomes through affective experiences,  
6 mediation analyses was conducted using PROCESS 2.12 (Hayes, 2012). As mediation requires a  
7 significant relationship between predictor (age) and mediator (affect indicator), we only  
8 considered indirect effects for those affect indicators that in the prior analyses yielded a relation  
9 with age. In Study 1, this concerned the mean of positive affect and mean and iSD of negative  
10 affect, as well as the negative reactivity slope. The latter was obtained by saving the event →  
11 negative affect slope from a multilevel analysis, in which affect was predicted by event valence  
12 and number of diary entry (see also Charles, Piazza, Mogle, Sliwinski, & Almeida, 2013). For the  
13 mediation model, we thus specified age as predictor, the mean of positive affect, the mean and  
14 iSD of negative affect, and the affective reactivity slope as parallel mediators, and job satisfaction  
15 and performance as outcomes. Organizational tenure and number of days were entered as  
16 covariates. Below, we report unstandardized coefficients (labeled *B*).

17 In this analysis, age was predictive of the mean of positive affect ( $B = .027$ ,  $SE = .007$ ,  $CI$   
18  $[.013; .040]$ ), the mean and iSD of negative affect ( $B = -.015$ ,  $SE = .005$ ,  $CI [-.025; -.006]$ ; and  $B = -$   
19  $.008$ ,  $SE = .003$ ,  $CI [-.015; -.002]$ ), and the negative reactivity slope ( $B = -.015$ ,  $SE = .004$ ,  $CI [-.024;$   
20  $-.006]$ ). The indirect effect of age on task performance via mean of positive affect ( $B = .006$ ,  $SE$   
21  $= .002$ ,  $CI [.002; .011]$ ) and mean of negative affect ( $B = .004$ ,  $SE = .002$ ,  $CI [.000; .009]$ ) were  
22 significant. However, the indirect effect of age on job satisfaction via affect dynamics was not  
23 significant. These findings imply that older workers' experience of more positive affect and less  
24 negative affect can contribute positively to their task performance.

## Study 2 (German Hospital Employees)

### Method

**Participants and procedure.** A sample of 126 healthcare workers were recruited from four hospitals of one large hospital operator in Germany by distributing flyers and through postings on the hospitals' intranet and newsletter. One person was excluded due to extensive missing data. The effective sample ( $N=125$ ) ranged in age from 21 to 65 years ( $M = 46.45$ ,  $SD = 9.95$ ) and 58.7% participants were women. Average organizational tenure was 13.06 ( $SD = 10.05$ ) years. The sample comprised 28 physicians, 53 nurses/ healthcare professionals, 27 administrative workers, and 18 participants with other professions (e.g., pedagogics).

Upon recruitment, participants received a link to a baseline online survey, which contained information about the study, an informed consent, demographic questions as well as measures of job satisfaction and work engagement. Participants further indicated their email address which was used to send them personalized links to the daily questionnaires. Over the next ten workdays, participants received an individualized link at 11 a.m. (accessible for 24 hours) to a daily online survey assessing that days' experienced positive and negative affect and work events. Participants completed the surveys at the end of the work shift or after work. In total, participants provided 1128 valid daily entries. A system error caused 16 participants to provide data for more than ten days, with a maximum of 13 entries. The number of valid diary entries per person ranged from 1 to 13 ( $M = 9.02$ ,  $SD = 2.81$ ). We recorded the day of the week (0 = Monday, 1 = Tuesday, 3 = Wednesday, etc.) and the time that diary entries were completed (in hours since midnight), which were used as covariates in the analyses. Upon study completion, participants were provided personalized feedback on their job satisfaction and work engagement and how it differed on days with high/low positive and negative affect, which they could retrieve on website via a self-generated code. As further incentive, the research team donated €5 for each completed baseline questionnaire and an additional €5 if the

1 participant had completed at least 7 daily surveys to a partner hospital in Israel. The research  
2 procedure was approved by the Ethical Committee Psychology at the University of Groningen.

### 3 **Measures.**

4 ***Daily work events.*** In contrast to Study 1, participants in this study could list multiple  
5 events per day, which allows for an independent assessment of positive and negative events. In  
6 each daily survey, participants were asked to list up to six pleasant or unpleasant work events  
7 they had experienced on that particular day in an open-answer format (see Kuba & Scheibe,  
8 2017). Examples of reported events included interpersonal events (“conflict with a colleague”,  
9 “good conversation with colleagues during lunch break”), events related to the task or work  
10 environment (“many emergency surgeries”, “good division of labor in close consultation with my  
11 colleagues”), and events related to personal issues (“slept in and experienced time pressure”). On  
12 average, 1.66 events ( $SD = 1.60$ , range 0-6) were listed per day. Next, participants rated each  
13 listed event as very negative, negative, neutral, positive, or very positive, which we used to  
14 determine the valence of events. To facilitate comparability with Study 1 (in which only the most  
15 intense event on a given day was selected for further ratings), we only considered those events  
16 rated as either very negative or very positive. We derived two event occurrence variables  
17 (positive vs. negative) where we compared days with at least one very negative or very positive  
18 event (coded as 1) from days without such events (coded 0). Across the 1128 daily reports, there  
19 were 651 (57.7%) days with no events, 172 (15.2%) days with only negative events, 242 (21.5%)  
20 days with only positive events, and 63 (5.6%) days with both negative and positive events.

21 ***Daily affect.*** Rather than measuring affective responses to daily events as in Study 1, in  
22 this study affect was assessed independent of events. At the beginning of each diary entry,  
23 participants indicated for each of eight affect terms on a 5-point Likert scale (1 = *never*, 2 =  
24 *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *very often*) how often they had experienced these on that

particular day. Items included low-arousal positive states (LAP: *calm, relaxed*), high-arousal positive states (HAP: *joyous, enthusiastic*), low-arousal negative states (LAN: *down, sluggish*), and high-arousal negative states (HAN: *upset, restless*). Extending Study 1, we were able to distinguish positive and negative affect in terms of arousal, a dimension that is receiving increased attention in research on emotional aging (e.g., Sands & Isaacowitz, 2016). A CFA performed with MPlus 7 showed that the fit of the four-factor model distinguishing affect by valence and arousal ( $\chi^2 = 157$ ;  $df = 32$ ; CFI = .93; RMSEA = .06; Omega = .67) outmatched the fit of a single-factor model ( $\chi^2 = 499$ ;  $df = 40$ ; CFI = .74; RMSEA = .59; Omega = .04; Satorra-Bentler scaled  $\chi^2 = 313$ ;  $df = 8$ ;  $p < .001$ ) and a two-factor model distinguishing positive and negative affect ( $\chi^2 = 354$ ;  $df = 38$ ; CFI = .82; RMSEA = .086; Omega = .819; Satorra-Bentler scaled  $\chi^2 = 161$ ;  $df = 6$ ;  $p < .001$ ). The iSD was also calculated for each of the four types of affect.

**Person-level variables.** We assessed participants' age (in years), gender (0 = men, 1 = women), and organizational tenure (in years). We also assessed rank of position (0 = no leadership function, 1 = leadership function), yet it was excluded in the following analyses due to too many missing cases. In the baseline survey, participants further rated their job satisfaction over the past four weeks on a 7-point scale ranging from 1 (*very dissatisfied*) to 7 (*very satisfied*). Previous validation work supports the use of single-item measures for job satisfaction (G. G. Fisher, Matthews, & Gibbons, 2016). Participants rated their work engagement using a shortened 3-item version of the Utrecht Work Engagement Scale (UWES, Schaufeli, Bakker, & Salanova, 2006). Items represented all three subscales (vigor, dedication, and absorption). A sample item is "I am proud of the work that I do." Responses were given on a 7-point scale ranging from 1 (*never*) to 7 (*always*). Reliability was acceptable ( $\alpha = .82$ ).

## Results

**Preliminary analyses.** Table 3 presents descriptive information and intercorrelations for central study variables. The four types of affect were moderately intercorrelated both at the day level (absolute correlations ranging from .32 to .47; all  $ps < .001$ ) and the person level (.30 to .63, all  $ps < .001$ ). As expected, positive affect (LAP and HAP) was negatively related to negative affect (LAN and HAN). Age was correlated with organizational tenure ( $r = .50, p < .001$ ); both age and tenure were unrelated to gender. The intra-class correlations indicate that 80% and 83%, respectively, of the variance of negative and positive events, were located at the day level. Moreover, between 47% and 63% of the variance in affect were located at the day level.

**Age differences in daily affect and work events.** We again tested Hypotheses 1 to 3 and our research questions simultaneously in one MSEM using MPlus 7. We predicted positive and negative event occurrence by age. We predicted the four types of affect (LAP, HAP, LAN, HAN) by positive and negative event occurrence, age, as well as the cross-level interaction between event occurrence and age. As covariates we included the number of diary entry, weekday, and time of day at Level 1, as well as gender, tenure, and overall number of events at Level 2.

As shown in Table 4, age was unrelated to negative event occurrence, yet it was positively related to positive event occurrence ( $B = .006, SE = .003, p = .021$ ). Thus, older participants reported positive events more frequently than younger participants, providing partial support for Hypothesis 3. Gender was positively related to event occurrence, such that women reported both more positive events ( $B = .105, SE = .046, p = .022$ ) but also more negative events ( $B = .109, SE = .040, p = .007$ ) than men. Positive events were more often reported towards the end of the week ( $B = .018, SE = .008, p = .020$ ), and both types of events were more often reported when the survey was filled in at a later time of day (positive events:  $B = .007, SE = .003, p = .036$ ; negative events:  $B = .007, SE = .003, p = .022$ ). The latter effect may result from the fact that people with longer workdays –

1 which could increase the chance that affective events occur – completed the diary entry later in the  
2 day.

3 LAP and HAP were lower on days with negative events, relative to days without negative  
4 events, while LAN and HAN were higher. At the same time, age moderated the relationship between  
5 negative event occurrence and LAN such that older participants experienced less of an increase in  
6 LAN than younger participants ( $B = -.015$ ,  $SE = .006$ ,  $p = .012$ ). No significant moderation effect  
7 appeared for the remaining three types of affect. Thus, there was partial evidence that higher worker  
8 age is associated with lower reactivity to negative events. The occurrence of positive events was  
9 related to increased LAP and HAP and reduced LAN and HAN; there was no moderation effect of  
10 age on reactivity to positive events. Hence, in response to our research question about affective  
11 reactivity, we found older workers to react less strongly to negative work events than younger  
12 workers on some dimensions of affect, but there were no age differences in reactivity to positive  
13 events. Weekday predicted levels of HAN negatively ( $B = -.028$ ,  $SE = .013$ ,  $p = .028$ ), suggesting  
14 improved well-being as the weekend nears.

15 **Age differences in affect stability.** Addressing Hypothesis 2 (age differences in affect  
16 stability), we regressed the iSD of each type of affect on age in separate analyses, accounting for  
17 gender, organizational tenure, and total number of diary days. Age negatively predicted iSD of  
18 LAN ( $B = -.008$ ,  $SE = .003$ ,  $p = .012$ ), but none of the other three iSD indicators (all  $ps > .10$ ).  
19 Thus, there was only partial support for Hypothesis 2. When additionally accounting for mean  
20 affect levels, these results were robust. The iSD of LAP and HAN were further predicted by  
21 gender ( $B = .096$ ,  $SE = .042$ ;  $p = .024$  and  $B = .112$ ,  $SE = .049$ ,  $p = .024$ ), indicating stronger  
22 affect variability for women than men. The iSD of LAN was further positively predicted by  
23 organizational tenure ( $B = .006$ ,  $SE = .003$ ,  $p = .035$ ).

**Indirect associations of age with work-related outcomes.** The prior analyses showed that age was related to a higher frequency of positive event days, lower LAN reactivity to negative events, and lower variability of LAN (iSD). To examine Hypothesis 4 that age had indirect effects on work-related outcomes through these affective variables, we again conducted mediation analyses using PROCESS. We included all three potential mediators simultaneously; and included gender, organizational tenure, and number of event days as covariates. As in Study 1, LAN reactivity to negative event scores were obtained by saving the negative event  $\rightarrow$  LAN slope from a multilevel analysis performed with MPlus, in which we modelled the four types of affect as a function of negative and positive event occurrence and day-in-survey.

The PROCESS analysis revealed positive effects of age on number of positive events ( $B = .008$ ,  $SE = .003$ ,  $CI [.002; .014]$ ), LAN reactivity to negative events ( $B = -.005$ ,  $SE = .002$ ,  $CI [-.008; -.001]$ ), and iSD of LAN ( $B = -.008$ ,  $SE = .003$ ,  $CI [-.015; -.002]$ ). Job satisfaction was not significantly predicted by either age, affective variables, or any covariates. Accordingly, none of the indirect effects were significant. Work engagement was negatively predicted by iSD of LAN ( $B = -.739$ ,  $SE = .370$ ,  $CI [-1.471; -.007]$ ), and at trend-level by number of positive events ( $B = .669$ ,  $SE = .365$ ,  $CI [-.055; 1.392]$ ), while the effects of LAN reactivity, age, and the covariates were all non-significant. The indirect effects of age on work engagement via iSD of LAN ( $B = .006$ ,  $SE = .004$ ,  $CI [.001; .017]$ ) and number of positive events ( $B = .005$ ,  $SE = .003$ ,  $CI [.001; .014]$ ) were both significant. This suggests that older workers' experience of more positive events and higher stability of LAN contributes positively to their work engagement (though not to their job satisfaction).

### Study 3 (German Office Workers)

#### Method

**Participants and procedure.** The sample consisted of 121 German office workers. The majority ( $n = 94$ ) were recruited from a municipal administrative center. The remaining 27



1 participants were recruited from the personal network of a research assistant. Seven participants  
2 did not provide data in the diary study (see below) and two participants reported no events across  
3 all diary days; these were excluded from analysis, resulting in an effective sample of 112  
4 employees. Of the sample, 64% were female and 33% were in supervisor positions. Participants  
5 ranged in age from 20 to 64 years ( $M = 44.8$ ,  $SD = 10.8$ ) and worked for their company on  
6 average 18.7 years ( $SD = 11.8$ ).

7       After reaching agreement with the municipal administrative center on conducting the study,  
8 a link to a sign-up form was posted on the center's intranet. Participants from outside the  
9 organization were contacted directly via email and were provided the link to the sign-up form. After  
10 enlisting for the study and providing informed consent, participants left their email address and  
11 indicated their work days. Participants received a personalized link via email to a baseline survey  
12 (assessing demographic information, job satisfaction, work engagement, and further variables not  
13 included in this paper) and to daily surveys on the following workdays (assessing that days'  
14 experienced positive and negative work events and emotional responses to each event). Participants  
15 were instructed to complete at least three daily surveys at the end of their workday or later at home.  
16 The daily links were sent at 11a.m. and were valid for 24 hours. In total, participants provided 358  
17 valid daily entries ( $M = 3.13$ ,  $SD = 0.96$ , range 1 to 7) and reported a total number of 966 events ( $M$   
18  $= 8.6$ ,  $SD = 5.0$ , range 1 to 30). We recorded the day of the week (0 = Monday, 1 = Tuesday, 3 =  
19 Wednesday, etc.) as a covariate for analyses. At the end of the study, participants received  
20 personalized feedback on their emotion regulation style (this measure is not part of the current  
21 report) and took part in a raffle of two online vouchers each worth €100. The research procedure was  
22 approved by the Ethical Committee Psychology at the University of Groningen.

### 23       **Measures.**

**Daily work events and affective responses.** In each daily survey, participants were asked to list up to six pleasant and six unpleasant work events they had experienced on that particular day (see Kuba & Scheibe, 2016). Pleasant and unpleasant work events were assessed in separate blocks and event valence was counterbalanced between daily entries. In total, participants reported 553 positive and 413 negative daily events across all study days.

For each event, participants indicated the time period when the event happened (choosing between twelve 2-hour windows ranging from 0:00-2:00 to 22:00-24:00) and which emotions these events elicited. For *positive events*, we assessed four positive emotional responses, including *elated*, *delighted* (both representing HAP), *serene*, and *at ease* (both representing LAP). Emotion ratings were made on a scale from 1 (*not at all*) to 5 (*very much*). The average correlation between elated and delighted across events was .67, and the average correlation between serene and at ease was .52; therefore, we deemed it appropriate to combine these into HAP and LAP subscales, respectively.

For negative events, we assessed four negative emotional responses, including *annoyed*, *worried* (both representing HAN), *down*, and *sluggish* (both representing LAN). The average correlation between down and sluggish across events was .43 and we combined the two items into a LAN subscale. The correlation between annoyed and worried was, however, low (mean  $r = .21$  across events, range from .02 to .50); therefore, we opted to analyze the two items separately.

**Person-level variables.** As covariates, we assessed participants' age (in years), gender (0 = men, 1 = women), organizational tenure (in years), and supervisory function (0 = no supervisor, 1 = supervisor). As in this study, multiple events and associated emotional responses were rated in the same daily survey, these may be confounded by mood experienced in the morning of the working day (Rothbard & Wilk, 2011). To account for this, we assessed morning level of affect each day ("How did you start into your workday this morning?" 1 = *very exhausted* to 5 = *very rested*) and mood (1 = *very negative* to 5 = *very positive*). The two items were moderately to

1 strongly positively correlated across the three days ( $r_s = .53, .45$ , and  $.59$ , all  $ps < .001$ ) and were  
2 therefore combined into a morning affect score. For reasons of simplicity we further aggregated  
3 morning affect across days, turning it into a person-level variable.

4 In the baseline survey, participants also rated their job satisfaction over the past month on  
5 a 7-point scale (1 = *very dissatisfied*, 7 = *very satisfied*); and their work engagement using the 9-  
6 item UWES (Schaufeli et al., 2006) on a 7-point scale (1 = *never*, 7 = *always*).

## 7 Results

8 **Preliminary analyses.** Table 5 presents descriptive information and intercorrelations for  
9 central study variables. Note that positive affect was rated only for positive events, whereas  
10 negative affect was rated only for negative events. Therefore, it is not possible to correlate them  
11 at the event-level. Instead, we present intercorrelations for scores aggregated to the person-level.  
12 Intercorrelations between the five types of affect were all significant and positive (ranging from  
13  $.20$  to  $.63$ ), except for the correlations between LAP with Worried and LAN, which were  
14 nonsignificant. This suggests that workers who tended to react more strongly to positive events  
15 also tended to react more to negative events.

16 The number of reported positive events was strongly correlated with the number of reported  
17 negative events ( $r = .59, p < .05$ ), likely because event reports are due to the number of daily surveys  
18 completed. We therefore controlled for number of daily surveys in the following analyses. Age was  
19 correlated with organizational tenure ( $r = .64, p < .05$ ). Intra-class correlations indicate that 80% and  
20 83%, respectively, of the variance in affective responses were located at the event level.

21 **Age differences in work events and affective responses.** We tested age differences in  
22 number of reported events with regression analysis. We accounted for gender, tenure, supervisory  
23 position, number of daily surveys, and (average) morning affect. In partial support of Hypothesis  
24 3 and consistent with Study 2, age was positively related to the number of positive events ( $B =$

.076,  $SE = .034$ ,  $p = .028$ ) but unrelated to the number of negative events ( $B = .049$ ,  $SE = .031$ ,  $p = .12$ ). Of the covariates morning affect was a significant negative predictor of reporting negative events ( $B = -1.365$ ,  $SE = .386$ ,  $p = .001$ ); all other covariates yielded non-significant effects (all  $ps > .10$ ).

We tested age differences in affective responses using multilevel modeling with MPlus, with events representing Level 1 and person-level differences modelled at Level 2. To account for our data structure (positive responses only assessed for positive events and negative responses only assessed for negative events), we modelled positive and negative affective responses in two separate models. In both models, we accounted for time of day and weekday at level 1 and for gender, tenure, supervisory position, number of daily entries, and average morning affect at Level 2. Results are shown in Table 6.

As in the prior studies, age was unrelated to *positive affective responses* (both HAP and LAP). Among event-level covariates, weekday predicted LAP positively ( $B = 0.055$ ,  $SE = .027$ ,  $p = .043$ ), suggesting that LAP increased from Monday to Friday. Among the person-level covariates, morning affect predicted LAP ( $B = .287$ ,  $SE = .124$ ,  $p = .021$ ), indicating that people who started their workday in a more positive mood responded with more LAP to positive events. Morning affect did not predict HAP responses. Regarding *negative affective responses*, age was unrelated to being annoyed and to LAN. In contrast to the prior studies, age was positively related to the experience of being worried ( $B = .029$ ,  $SE = .010$ ,  $p = .004$ ). Time of day predicted LAN positively ( $B = .079$ ,  $SE = .029$ ,  $p = .006$ ), suggesting that the LAN response increased across the workday. Morning affect predicted worried ( $B = -.654$ ,  $SE = .131$ ,  $p = .001$ ) and LAN responses ( $B = -.440$ ,  $SE = .133$ ,  $p = .001$ ), such that people who started their workday in a more positive mood responded with less negative affect. Morning affect did not predict annoyed responding. None of the other person-level covariates were related to the indicators of positive and negative affective responses.

**Age differences in affect stability.** We regressed the iSD of each type of affect on age in separate analyses, accounting for gender, organizational tenure, supervisory function, and total number of daily reports. Some participants only reported one negative or positive event, thus, their iSD could not be meaningfully computed, reducing the effective sample to  $n = 80$ . Contrasting Hypothesis 2, age was unrelated to the iSD's of all five types of affect (all  $ps > .10$ ). Findings were robust when additionally accounting for mean affect levels.

**Indirect associations of age with work-related outcomes.** The prior analyses showed that age was related to higher number of positive events and higher worried responses to negative events. We therefore tested indirect effects of age on work-related outcomes via number of positive events and worried responding, using the PROCESS macro. We included both potential mediators in the same model, and accounted for gender, tenure, supervisory function, number of daily reports, and morning affect.

The PROCESS analysis revealed positive predictive effects of age on number of positive events ( $B = .089$ ,  $SE = .038$ ,  $CI [.014; .064]$ ) and worried responses to negative events ( $B = -.028$ ,  $SE = .012$ ,  $CI [-.007; .049]$ ). Job satisfaction was not significantly predicted by number of positive events or worried responding, though morning affect emerged as a significant covariate ( $B = .673$ ,  $SE = .284$ ,  $CI [.108; 1.238]$ ). None of the indirect effects on job satisfaction were significant. Work engagement was positively predicted by number of positive events at trend level ( $B = 0.080$ ,  $SE = .045$ ,  $CI [-0.010; .169]$ ), but not by worried responding. Organizational tenure emerged as a negative predictor ( $B = -.041$ ,  $SE = .015$ ,  $CI [-.072; -.011]$ ), while morning affect was a positive predictor ( $B = .564$ ,  $SE = .223$ ,  $CI [.109; 1.018]$ ). None of the other covariates were significant. The indirect effect of age on work engagement via number of positive events was significant ( $B = .007$ ,  $SE = .006$ ,  $CI [.001; .027]$ ), but not via worried responding. This replicates Study 2 that older

workers' experience of more positive events contributes positively to their work engagement (though not their job satisfaction).

### Discussion

In this paper, our goal was to comprehensively examine age-related differences in levels and dynamics of workplace affect by investigating data from three diary studies with workers of different cultural and occupational backgrounds. We distinguished four components of daily affective experience at work, mean levels, variability of affect, occurrence of affective daily events, and the reactivity to such events; and tested indirect effects of age – via mean levels and dynamics of affect – on individual differences in work outcomes. Overall, the patterns of age differences were not entirely consistent across samples. Yet remarkably, when age effects were found, they nearly always pointed to an older-age advantage in affective experience and the associated work outcomes.

### Findings on Levels and Variability of Affect

Based on theories and earlier findings from the lifespan development and organizational literatures, we had hypothesized higher age to be associated with higher levels of positive affect and lower levels of negative affect. We had further predicted that affect is more stable (i.e., less variable) with age, which represents a correlate of mental well-being (Houben et al., 2015). We tested these hypotheses in Studies 1 and 2 (the design of Study 3 precluded testing for age differences in levels and variability of affect, as affect was assessed in relation to multiple specific events per day). In Study 1 with Hong Kong Chinese managers, hypotheses were largely confirmed using indicators of positive and negative affect. Older managers reported higher affective well-being across sampling days, as indicated by higher positive affect, lower negative affect, and higher stability of negative affect. In Study 2 with German hospital employees, which allowed us to distinguished subtypes of affect based on valence *and* arousal, we did not find age differences in mean levels of affect.

1 However, LAN as one subtype of negative affect was again more stable in older than younger  
2 employees. In neither study did we find age differences in positive affect variability.

3         These findings are actually quite consistent with earlier research. Regarding levels of affect,  
4 earlier studies in the work setting also have found either higher affective well-being as a function of  
5 age (e.g., Dahling & Perez, 2010; Yeung et al., 2011) or no age differences in affect (Bindl et al.,  
6 2012; Tavares, 2016); whereas lower affective well-being with age is rarely if ever found. Regarding  
7 variability of affect, prior studies in the work setting do not exist. Yet, our finding that age predicts  
8 lower variability of (subtypes of) negative affect but not positive affect dovetails with two earlier  
9 studies in the lifespan development literature (Brose et al., 2013; Grühn et al., 2013).

10         For the work setting, these findings imply that older employees are unlikely to have *lower*  
11 affective well-being than their younger colleagues. However, whether or not older employees  
12 experience *higher* well-being than their younger colleagues may be due to moderating factors. In our  
13 studies, it was the Hong Kong Chinese sample of managers that showed more robust older-age  
14 advantages in affective well-being than the German sample of hospital workers. Possible reasons lie  
15 either in cultural or occupational characteristics. Chinese people emphasize interpersonal harmony to  
16 a greater extent than their Western counterparts (Oyserman, Coon, & Kemmelmeier, 2002), which  
17 motivates them to constantly control their negative emotions once they occur. With the use of  
18 effective emotion regulation strategies, older Chinese workers could maintain better affective well-  
19 being than their younger peers (Yeung et al., 2011). In addition, managerial jobs often come with  
20 high job autonomy and status (Lawson, 1988); both of these factors could trickle down to positively  
21 affect older employees' daily well-being. Larger samples representing a variety of cultural and  
22 occupational backgrounds are needed to more fully test moderating factors of age effects on  
23 workplace affect, in order to determine when older employees tend to experience more positive and  
24 stable affect, and when they do not.

Notably, age differences in levels of affect found in the Hong Kong Chinese sample appeared to account for higher self-rated task performance with age. This is not surprising in light of earlier work showing that levels of affect predict job attitudes (Spector, 1997) and performance (Kaplan et al., 2009). It suggests that better affective well-being may be a contributing factor to more favorable job attitudes at higher worker age (Ng & Feldman, 2010), highlighting a potential mechanisms underlying age-related benefits in employee well-being and effectiveness.

### **Findings on Affective Events and Reactivity**

In order to derive a fuller picture of age differences in the affective lives of workers, we further examined in all three samples the occurrence and affective reactivity to daily events experienced at work. Whereas the bulk of research on aging and affective reactivity so far has focused on negative events (aka daily stressors), our studies are among the few that considered daily events of both negative and positive valence. Based on lifespan theories of well-being and earlier research outside the work setting, we had predicted that higher age is associated with reporting fewer negative and more positive daily work events. We did not specify hypotheses on the relationship between worker age and affective reactivity to daily work events, as lifespan theories make nuanced predictions based on distance to events (i.e. whether affect during or surrounding the negative event is measured) and contextual factors (e.g. levels of cognitive functioning or chronic stress, Charles, 2010), and because prior studies have yielded mixed results (Sliwinski & Scott, 2014). Among our studies, two assessed affect intensity during events, while the third one assessed affect frequency on the day surrounding an event.

In contrast to earlier studies (e.g., Nägel, Sonnentag, & Kühnel, 2015) but consistently across our three samples, there were no age differences in the frequency of negative daily work events. This is important as it indicates that any well-being advantages we found cannot be attributed to the fact that older participants have less stressful lives (see also Brose et al., 2013). We did, however, find in



two of the three studies that older employees report more positive daily events than younger adults. A similar age trend was reported in a longitudinal study with older men aged 50s and above (Aldwin et al., 2014); our study thus extends these findings to samples of workers spanning young and middle adulthood. Notably, daily events were assessed through self-report; therefore, it is unclear whether older employees actually experience more positive events. It is equally plausible that they attend more than younger employees to positive events in their daily work or remember positive events more when filling in the daily survey. These predictions are in fact consistent with SST (Carstensen, 2006) and research on the age-related positivity effect in attention and memory (Reed et al., 2014). Whatever the cause of age differences, positive daily work events deserve more attention as they are experienced frequently during the workday and can potentially reduce resource drain resulting from daily negative events and chronic stressors (Gross et al., 2011). Moreover, in both studies that yielded age differences in positive event occurrence, these were in turn associated with person-level work engagement, and there was evidence of indirect effects of age on work engagement via positive events. This suggests that positive daily events are a contributing factor to higher work engagement with age.

Regarding affective reactivity, there was no clear-cut pattern of age differences for negative daily events, which is in line with prior findings (Sliwinski & Scott, 2014). In Study 1, the older Chinese managers' negative affect responses to negative work events appeared less pronounced than those of younger managers (with no differences for positive affect). In other words, they appeared to be more resilient and better able to keep negative affect down when in the midst of negative work events. In Study 2, which measured affect frequency across the whole day, the older German hospital employees also reacted less strongly to negative daily events than younger employees in terms of a subtype of negative affect, LAN (with no differences in HAN, LAP, and HAP reactivity). In contrast, older German office workers in Study 3 showed higher worry intensity in response to

negative daily events than younger workers (with no age differences in LAN and “annoyed” intensity). Again, these divergent findings may be attributable to occupational differences. It is possible that office workers in Study 3 have the lowest level of autonomy among the three samples; they also may have the lowest levels of job demands. Challenging job demands are important as they may stimulate workers to improve their affect regulation skills and resilience as they get older (Ilies, Aw, & Pluut, 2015).

Our findings further imply that the distinction between affect intensity during the event and affect frequency on the day surrounding the event does not provide a clear-cut picture of when age differences are most likely to emerge. A possible reason could be that in all three studies – as in prior studies on daily stress – both affect during the event and affect surrounding daily events were measured once a day, at the end of or after work time, which could lead to a blending of processes occurring during and surrounding events. More attention should be devoted in future studies on daily affective events to disentangling the different processes involved during and surrounding events and how they are reflected in measures of affect intensity vs. frequency.

A finding that was robust across the three samples was the lack of an association between age and affective reactivity to positive events, no matter whether affect intensity during the event or affect frequency on the day surrounding the event were measured. There is a dearth of research on aging and positive event reactivity (see Gunaydin et al., 2016 for an exception), and our studies are the first test of this relationship in the work setting. The fact that the lack of age differences in positive event reactivity was robust across the three samples is therefore an important contribution. It fits well with the notion that older adults are motivated to maintain positive affect but are not necessarily more motivated than younger adults to *enhance* it (Riediger et al., 2009). Thus, older employees’ “recipe” for higher work engagement may be the frequent experience of positive daily work events rather than drawing more affective benefits from positive events once they occur.

## 1 **Limitations and Future Directions**

2       The combination of three samples differing in cultural and occupational background, and the  
3 variations in the measurement of events and affect, allowed us to identify age effects that were  
4 robust and generalizable across at least two studies, such as the higher stability of negative affect  
5 with age, the higher frequency of positive events (which in turn predicted higher work engagement),  
6 and lower reactivity to negative events. Moreover, the lack of age differences in number of negative  
7 daily events and in affective reactivity to positive events was robust across all samples, which points  
8 at their generalizability. However, our sample composition and design differences also limit our  
9 ability to understand why some age effects differed between studies, which could be due to cultural  
10 factors, occupational characteristics, measurement differences, or a combination of the three. A  
11 fruitful direction therefore would be to conduct a large-scale study where cultural and occupational  
12 background of participants are systematically varied, and where events and affect both during and  
13 surrounding daily events are systematically assessed. Such a study may also include more direct  
14 measures of cultural differences in emotion regulation and occupational demands, in order to test  
15 mechanisms underlying different age-related patterns of affect. It is possible that cultures in which  
16 emotion regulation goals are more chronically activated, and occupations that stimulate workers to  
17 develop their emotional competencies over time, will facilitate age-related benefits in affective  
18 functioning. It is also possible that age-related advantages are more pronounced before and after  
19 affective events than they are during affective events, as the SAVI model would suggest.

20       Another limitation is that our studies assessed affect and daily events once in the evening  
21 using self-report. End-of-day reports of daily events may be biased by retrospective recall, either  
22 because people forget events or because their outcomes or resolution make them no longer worth  
23 reporting (Sliwinski & Scott, 2014). We also have no information on the objective severity of  
24 experienced events and it is possible that the threshold to categorize an event as severe enough to be

worth reporting differs from one person to the other (although this is less likely the case in Study 1 that used an event checklist). Attention to these issues is especially important when studying age differences, as older adults were found to recall the past more positively than younger adults (Reed et al., 2014). Experience-sampling studies that measure event occurrence and affect intensity and frequency multiple times per day, either at predetermined intervals or event-based, offer a higher temporal resolution and precision in event reporting. Future studies would further benefit from more diverse measures, such as checklists of daily work events pre-rated for severity (for a parallel measure of life events, see Hobson & Delunas, 2001), objective indicators of task performance (see e.g., Yeung & Fung, 2012), peer reports (Bruk-Lee & Spector, 2006), or physiological indicators of affect (Ilies, Dimotakis, & Watson, 2010).

Additionally, any cross-sectional study of aging at work is inherently limited in its possibility to disentangle age and generational effects. Age differences shown in the present studies may be due to aging, but also to generational effects – historical trends towards lower well-being that would lead to older workers appearing better off than younger workers; or healthy worker effects – the tendency of low-functioning older workers to retire (G. G. Fisher, Chaffee, & Sonnegg, 2016). Importantly, cross-sectional and longitudinal findings on age and affect may not converge. For example, one 10-year longitudinal study with a general-population sample yielded increases of negative affect over time, while at any given point in time, older people reported lower negative affect than younger people (Sliwinski et al., 2009). Measurement-burst designs that repeat daily diary studies over time are needed to investigate aging effects in affect dynamics while ruling out generational effects.

The current set of studies tested indirect effects of age – via affect levels and dynamics – on self-reported work engagement, job satisfaction, and performance. Interestingly, indirect effects were found only for affect variables situated at the person-level (e.g. mean levels of affect or number of events), but less so for variables reflecting affect dynamics (e.g. event reactivity). It is possible

that affect dynamics would be more predictive if the work outcomes were assessed at the day level. For example, a momentary increase in negative affect after a negative event may predict subsequent momentary task performance but not necessarily average levels of performance (Beal et al., 2005). Future research should measure both affect and work outcomes at the day level.

### **Practical Implications**

Daily affective experiences play an important role in organizational effectiveness, as they drive employees' attitudes, decisions, and behaviors (Brief & Weiss, 2002). The older-age advantages in affective well-being found in the present studies provide important implications to management regarding future recruitment, staff retention, and job assignment. Older employees are often less prioritized in selection processes due to their changes in physical and cognitive abilities. However, our studies reveal that relative to younger peers, older workers are more emotionally stable and can quickly recover from negative setbacks at work. They also show a greater tendency to perceive their daily work experiences as positive, which will protect them from experiencing high levels of overall work stress (Ong, Bergeman, Bisconti, & Wallace, 2006). These psychological strengths enable older workers to continue to be successful at work, especially in service-oriented industries which require emotional stability and resilience to interpersonal stressors. Another valuable consequence of more positive workplace affect with age may be a stronger affective commitment to the organization (C. D. Fisher, 2002). Workers with high affective commitment have an emotional tie to the organization that motivates them to remain, not because it would be too costly to leave, but because they have a sense of contribution and identification with the organization (Meyer, Stanley, Herscovitch, & Topolnytsky, 2002). Our findings also provide insights for job assignments in organizational contexts: higher work engagement and performance may result from assigning older workers tasks that utilize their emotional competencies and knowledge (Kanfer & Ackerman, 2004).

## 1 **Conclusion**

2       Older workers comprise an increasing proportion of today's workforce, and such trends  
3 often worry organizational practitioners – many of whom associate aging with vulnerability and  
4 declining productivity. The current set of studies contributes to increasing evidence that such  
5 negative views are unjustified. Older workers are likely to function as well as or even better than  
6 younger workers at the emotional level. Several of the indicators of affective experience emerged as  
7 mediators of positive age differences in work engagement and self-rated performance. At the same  
8 time, it became clear that some of the positive age effects were present in only one or two of the  
9 three samples, and one finding in the sample with office workers pointed at stronger negative  
10 reactivity to daily events at higher age. Future research is needed that systematically investigates  
11 contextual moderators of age effects at the individual, occupational, or cultural level.

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15



Table 1

*Descriptive Statistics and Correlation between Day-Level and Person-Level Variables, Study 1 (Chinese Managers)*

	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11	12
<b>Variables assessed at person-level</b>													
1. Age	42.45 (8.97)	—											
2. Gender	--	<b>-.28</b>	—										
3. Organizational tenure	11.31 (9.94)	<b>.57</b>	<b>-.19</b>	—									
4. Job position	.61 (.49)	.02	<b>-.25</b>	<b>-.17</b>	—								
5. Job satisfaction	4.91 (1.29)	.03	.00	-.07	-.02	—							
6. Task performance	3.87 (.54)	.14	-.05	.03	-.02	<b>.41</b>	—						
<b>Variables assessed at day-level</b>													
7. Positive affect <sup>1</sup>	2.49 (.64)	<b>.32</b>	-.03	.13	-.06	<b>.20</b>	<b>.17</b>	—					
8. Negative affect <sup>1</sup>	1.66 (.48)	<b>-.26</b>	-.01	<b>-.16</b>	<b>.02</b>	-.13	<b>-.17</b>	<b>-.46</b>	—				
9. iSD of positive affect	.74 (.29)	-.11	.05	<b>-.25</b>	.06	.06	.03	.07	.09	—			
10. iSD of negative affect	.58 (.31)	<b>-.27</b>	.14	<b>-.22</b>	-.02	-.03	-.06	<b>-.20</b>	<b>.73</b>	<b>.41</b>	—		
11. Positive reactivity slope <sup>2</sup>	-1.31 (.33)	<b>.17</b>	-.08	<b>.19</b>	.05	-.01	-.04	-.04	-.09	<b>-.75</b>	<b>-.30</b>	—	
12. Negative reactivity slope <sup>2</sup>	.94 (.39)	<b>-.35</b>	.10	<b>-.21</b>	-.11	-.01	-.05	-.11	<b>.76</b>	<b>.17</b>	<b>.83</b>	<b>-.19</b>	—
13. Event valence	.50 (.23)	-.08	-.06	-.05	<b>.17</b>	<b>-.22</b>	<b>-.19</b>	<b>-.65</b>	<b>.59</b>	.05	<b>.23</b>	-.02	.01

*Note.*  $N = 150$ . Gender was coded as 0 = men and 1 = women. iSD denotes intraindividual standard deviation. Job position was coded as 0 = officer and 1 = manager. Event valence was coded as 0 = positive event and 1 = negative event occurred on the sampling day. Correlation coefficient displayed in bold are significant at  $p < .05$ . <sup>1</sup>The scores of day-level variables were aggregated from the data of the daily diary study. <sup>2</sup>Positive and negative reactivity slopes refer to the difference in affect when comparing days with a negative event and days with a positive event.

Table 2

*Multilevel Analyses on Positive and Negative Affect and Occurrence of Negative Events, Study 1 (Chinese Managers)*

	B (SE)		
	Negative Event Occurrence	Positive Affect	Negative Affect
<b>Intercept</b>	.354 (.141)*	2.958 (.215)***	1.184 (.149)***
<b>Level 1 (Day-level)</b>			
Number of diary entry	-.007 (.004)*	-.003 (.004)	-.001 (.004)
Event valence	—	-1.506 (.648)*	.617 (.290)*
Weekday	-.022 (.009)*	-.001 (.009)	-.002 (.009)
Time of day	.036 (.057)	-.023 (.062)	-.040 (.056)
<b>Level 2 (Person-level)</b>			
Age	-.003 (.002)	.020 (.006)***	-.005 (.003)
Gender	-.009 (.037)	.001 (.083)	-.007 (.045)
Organizational tenure	.002 (.002)	-.005 (.005)	.001 (.003)
Job position	.074 (.037)*	.019 (.083)	.007 (.044)
No. of event days	.015 (.006)**	.027 (.012)*	.011 (.007)
<b>Cross-level interaction</b>			
Age x Event valence	—	.006 (.005)	-.015 (.005)***

*Note.* Valence of the event was coded as 0 = positive event and 1 = negative event. Weekday was coded 0 = Monday, 1 = Tuesday, 2 = Wednesday, etc. Time of day was coded as 1 = morning and 2 = evening. Gender was coded as 0 = male and 1 = female. Position was coded as 0 = officer and 1 = manager. The -2 log likelihood value is -2865.595 ( $df = 39$ ). \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

Table 3

*Descriptive Statistics and Correlations Between Central Study Variables, Study 2 (German Hospital Employees)*

	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<b>Variables assessed at person-level</b>															
1. Age	46.45 (9.95)	—													
2. Gender	--	-.11	—												
3. Organizational tenure	13.06 (10.05)	<b>.50</b>	-.03	—											
4. Job satisfaction	4.56 (1.57)	.06	.03	-.08	—										
5. Work engagement	4.82 (1.09)	.15	.04	.03	<b>.45</b>	—									
<b>Variables assessed at day-level<sup>1</sup></b>															
6. Negative event(s)	0.21 (0.24)	.05	<b>.22</b>	.05	<b>-.22</b>	-.04	—								
7. Positive event(s)	0.27 (0.28)	.16	<b>.18</b>	.07	.13	<b>.21</b>	<b>.20</b>	—							
8. LAP	3.35 (0.63)	.03	-.08	-.02	.12	<b>.22</b>	<b>-.34</b>	.11	—						
9. HAP	2.83 (0.68)	-.11	.07	-.07	<b>.41</b>	<b>.42</b>	<b>-.33</b>	<b>.32</b>	<b>.34</b>	—					
10. LAN	1.77 (0.60)	-.08	-.11	.08	<b>-.28</b>	<b>-.30</b>	<b>.25</b>	<b>-.23</b>	<b>-.36</b>	<b>-.40</b>	—				
11. HAN	2.01 (0.59)	-.03	.00	.12	<b>-.27</b>	-.17	<b>.44</b>	.01	<b>-.42</b>	<b>-.27</b>	<b>.56</b>	—			
12. iSD of LAP	0.60 (0.23)	-.09	<b>.21</b>	.02	-.09	-.13	<b>.36</b>	.11	<b>-.24</b>	-.16	<b>.20</b>	<b>.28</b>	—		
13. iSD of HAP	0.55 (0.24)	.02	.14	-.05	-.09	-.06	.01	.00	-.03	.01	.15	.05	<b>.39</b>	—	
14. iSD of LAN	0.51 (0.29)	-.14	-.03	.09	-.17	<b>-.21</b>	.18	-.10	-.14	<b>-.23</b>	<b>.45</b>	<b>.36</b>	<b>.37</b>	<b>.28</b>	—
15. iSD of HAN	0.63 (0.26)	.11	<b>.18</b>	.11	-.03	-.06	.26	.07	-.10	-.13	<b>.18</b>	<b>.28</b>	<b>.45</b>	<b>.37</b>	<b>.33</b>

*Note.*  $N = 125$ . LAP = low-arousal positive affect. HAP = high-arousal positive affect. LAN = low-arousal negative affect. HAN = high-arousal negative affect. iSD denotes the intraindividual standard deviation. Event occurrence was coded as 0 = no negative/positive event and 1 = one or more negative/positive event(s). Gender was coded as 0 = men and 1 = women. Correlations displayed in bold are significant at  $p < .05$ . <sup>1</sup> Scores of day-level variables are aggregates of the daily ratings.

Table 4

*Unstandardized Coefficients From Multilevel Structural Equation Modelling Analyses Predicting Affective Responses to Daily Work Events, Study 2 (German Hospital Employees)*

	<i>B</i> (SE)					
	Negative event(s)	Positive event(s)	LAP	HAP	LAN	HAN
<b>Intercept</b>	0.178 (0.037)***	0.212 (0.042)***	3.442 (0.090)***	2.838 (0.094)***	1.907 (0.084)***	2.083 (0.083)***
<b>Level 1 (Day-level)</b>						
Negative event(s)	—	—	-0.496 (0.062)***	-0.353 (0.054)***	0.3842 (0.058)***	0.625 (0.078)***
Positive event(s)	—	—	0.235 (0.057)***	0.411 (0.059)***	-0.226 (0.050)***	-0.241 (0.058)***
Number of diary entry	-0.008 (0.004)*	-0.010 (0.004)*	-0.004 (.006)	-0.018 (0.006)**	-0.002 (0.006)	-0.020 (0.006)**
Weekday	0.001 (0.007)	0.018 (0.008)*	0.006 (0.013)	-0.007 (0.012)	-0.013 (0.012)	-0.028 (0.013)*
Time of day	0.007 (0.003)*	0.007 (0.003)*	-0.002 (0.006)	-.005 (0.005)	0.000 (0.005)	-0.002 (0.006)
<b>Level 2 (Person-level)</b>						
Age	0.002 (0.002)	0.006 (0.003)*	0.003 (0.006)	-0.006 (0.007)	-0.005 (0.006)	-0.006 (0.006)
Gender	0.109 (0.040)**	0.105 (0.046)*	-0.070 (0.107)	0.065 (0.114)	-0.213 (0.099)*	-0.006 (0.093)
Organizational tenure	0.001 (0.002)	0.000 (0.003)	-0.003 (0.006)	-0.003 (0.006)	0.008 (0.005)	0.009 (0.005)+
No. of negative event days	—	—	-0.637 (0.360)+	-1.083 (0.362)**	0.827 (0.337)*	0.782 (0.324)*
No. of positive event days	—	—	0.391 (0.306)	0.981 (0.315)**	-0.484 (0.271)+	0.031 (0.260)
<b>Cross-level interaction</b>						
Age x Negative event(s)	—	—	0.011 (0.006)+	0.004 (0.006)	-0.016 (0.006)*	0.006 (0.008)
Age x Positive event(s)	—	—	-0.003 (0.006)	-0.006 (0.006)	0.000 (0.005)	0.000 (0.006)

*Note.* Level 1  $N = 1128$ ; Level 2  $N = 125$ . LAP = low-arousal positive affect. HAP = high-arousal positive affect. LAN = low-arousal negative affect. HAN = high-arousal negative affect. Event occurrence was coded as 0 = no very negative/positive event and 1 = one or more very negative/positive event(s). Weekday was coded 0 = Monday, 1 = Tuesday, 2 = Wednesday, etc. Gender was coded as 0 = male and 1 = female. All hypotheses were tested simultaneously in one multilevel structural equation model; residual variances of the four affect variables were allowed to covary. The -2 log likelihood value is -5243.15 ( $df = 107$ ). +  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

Table 5

*Descriptive Statistics and Correlations Between Central Study Variables, Study 3 (German Office Workers)*

	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>Variables assessed at person level</b>																			
1. Age	44.76 (10.85)	—																	
2. Gender	—	<b>-.23</b>	—																
3. Org. tenure	18.66 (11.82)	<b>.64</b>	-.12	—															
4. Supervisor	—	.17	<b>-.23</b>	<b>.20</b>	—														
5. Job satisfaction	4.55 (1.69)	.04	.01	-.04	.02	—													
6. Work engagement	4.19 (1.37)	.08	.08	-.12	.11	<b>.54</b>	—												
7. Morning affect	3.32 (0.66)	.15	.00	.03	-.02	<b>.31</b>	<b>.32</b>	—											
<b>Variables assessed at event level</b>																			
8. No. positive events	4.94 (2.92)	.14	.05	-.02	-.06	.18	.18	.05	—										
9. No. negative events	3.69 (2.71)	.07	-.07	-.01	.03	-.12	-.15	<b>-.29</b>	<b>.59</b>	—									
10. LAP	3.31 (0.85)	-.02	-.03	-.03	-.15	<b>.22</b>	.07	<b>.20</b>	.10	.15	—								
11. HAP	3.15 (0.89)	-.03	.12	.03	-.14	<b>.23</b>	.14	.07	<b>.22</b>	.19	<b>.43</b>	—							
12. LAN	2.15 (0.92)	.10	-.11	.10	.02	<b>-.27</b>	-.17	<b>-.35</b>	.08	<b>.27</b>	.11	<b>.30</b>	—						
13. Annoyed	3.11 (0.91)	.04	-.09	-.02	-.14	.05	.08	.06	.14	.15	<b>.43</b>	.20	<b>.24</b>	—					
14. Worried	2.15 (0.93)	.14	.01	-.01	-.07	<b>-.21</b>	-.09	<b>-.42</b>	.12	<b>.29</b>	.13	<b>.22</b>	<b>.63</b>	<b>.30</b>	—				
15. iSD HAP	0.57 (0.33)	.01	.10	.08	.00	-.07	-.11	<b>-.24</b>	-.02	.02	<b>-.30</b>	-.14	-.01	<b>-.26</b>	.09	—			
16. iSD LAP	0.66 (0.38)	-.08	.17	-.05	-.05	-.06	-.02	<b>-.23</b>	<b>.19</b>	<b>.31</b>	.19	.02	.12	<b>.22</b>	<b>.25</b>	<b>.31</b>	—		
17. iSD LAN	0.68 (.041)	-.05	-.08	.03	-.14	-.18	-.21	-.17	.04	.11	.02	.18	<b>.43</b>	.08	.13	-.06	.04	—	
18. iSD Annoyed	1.09 (0.58)	-.17	.09	-.15	-.08	-.13	-.10	.00	-.03	.09	.16	.16	.04	-.10	.13	-.11	.05	.13	—
19. iSD Worried	0.90 (0.59)	.00	.05	-.04	.01	-.17	-.17	-.15	.11	.18	.17	.14	.19	.01	<b>.54</b>	.13	.20	<b>.32</b>	<b>.29</b>

*Note.*  $N = 112$ . Event-level and day-level variables were aggregated to the person-level. Gender was coded as 0 = male and 1 = female. Supervisor was coded 0 = no supervisory function and 1 = supervisory function. Correlations displayed in bold are significant at  $p < .05$ .

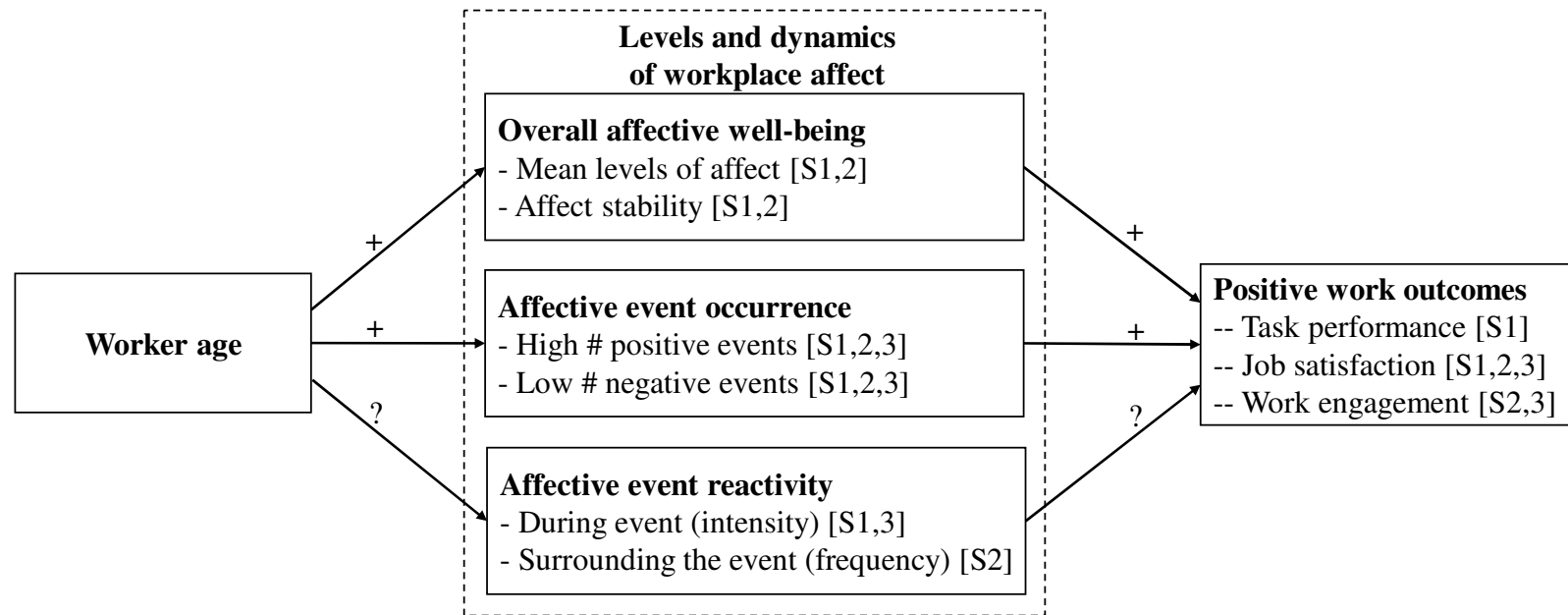
Table 6

*Unstandardized Coefficients From Multilevel Structural Equation Modelling Analyses Predicting Affective Responses to Daily Work Events, Study 3 (German Office Workers)*

	<i>B</i> (SE)				
	LAP	HAP	LAN	HAN: Annoyed	HAN: Worried
<b>Intercept</b>	3.379 (0.170)***	3.121 (0.178)***	2.185 (0.175)***	3.112 (0.193)***	2.039 (0.182)***
<b>Level 1 (Event-level)</b>					
Time of day	0.003 (0.022)	0.032 (0.026)	0.079 (0.029)**	0.016 (0.040)	0.046 (0.036)
Weekday	0.055 (0.027)*	0.021 (0.032)	0.046 (0.037)	0.079 (0.053)	0.010 (0.049)
<b>Level 2 (Person-level)</b>					
Age	0.002 (0.010)	0.000 (.010)	0.007 (0.010)	0.003 (0.010)	0.029 (0.010)**
Gender	-0.129 (0.177)	0.145 (0.182)	-0.170 (0.177)	-0.114 (0.184)	0.238 (0.176)
Organizational tenure	0.001 (0.009)	0.007 (0.009)	0.006 (0.009)	-0.002 (0.010)	-0.008 (0.009)
Supervisory function	-0.321 (0.180)+	-0.279 (0.185)	-0.098 (0.177)	-0.186 (0.183)	-0.123 (0.175)
Number of days	0.024 (0.087)	0.005 (0.092)	-0.117 (0.102)	-0.026 (0.113)	-0.051 (0.106)
Morning affect	0.287 (0.124)*	0.110 (0.130)	-0.440 (0.133)***	0.041 (0.134)	-0.654 (0.131)***

*Note.* Level 1  $N = 557$  for positive events and 419 for negative events; Level 2  $N = 114$ . LAP = low-arousal positive affect. HAP = high-arousal positive affect. LAN = low-arousal negative affect. HAN = high-arousal negative affect. Weekday was coded 0 = Monday, 1 = Tuesday, 2 = Wednesday, etc. Gender was coded as 0 = male and 1 = female. Supervisor was coded 0 = no supervisory function and 1 = supervisory function. Hypotheses regarding positive affect (HAP, LAP) and negative affect (HAN, LAN) were tested in two separate multilevel models; residual variances of the affect variables were allowed to covary. The -2 log likelihood value is -1237.66 ( $df = 24$ ) for positive affect and -1628.89 ( $df = 39$ ) for negative affect.

+  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ ; \*\*\*  $p < .001$ .



*Figure 1.* Conceptual model. Older workers, as compared to younger workers, are expected to show higher affective well-being (Hypothesis 1) and higher stability of affect (Hypothesis 2), and to report more positive and fewer negative work events (Hypothesis 3). The relation between worker age and affective event reactivity – either during the event or surrounding the event – is unclear. Age is predicted to have indirect relationships with positive worker outcomes via affect indicators (Hypothesis 4). The figure also indicates which variables was measured in which study [S = Study. S1 = Hong Kong managers. S2 = German healthcare workers. S3 = German office workers]. # = number.